applicants

ANSWER 4 OF 233 CA COPYRIGHT 2003 ACS on STN L4

AN 139:10513 CA

High-defect stabilized oxides for thermal-barrier coatings ΤI resistant to sintering in high-temperature service on turbine-alloy parts

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SO Eur. Pat. Appl., 6 pp. CODEN: EPXXDW

DT

Patent English LA

ICM C23C030-00 IC ICS F01D005-28

56-6 (Nonferrous Metals and Alloys) CC Section cross-reference(s): 57

FAN.CNT 1

PATENT NO. KIND DATE APPLICATION NO. DATE ----EP 1318215 20030611 EP 2002-79810 20021119 A2 PΙ EP 1318215 A3 20030709 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,

IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK US 2003108768 A1 20030612 US 2001-10676 20011206

PRAI US 2001-10676 20011206 Α

The oxide thermal-barrier coating having highly defective cubic matrix structure includes a high addn. of a stabilizer to promote the resulting O-vacancy interaction within the oxide matrix to form multiple vacancies, thereby improving the oxide resistance to sintering in high-temp. service. The ZrO2 as thermal-barrier coating is preferably stabilized with the high Y2O3 concn. .gtoreq.30% by wt., exceeding the .apprx.25% stabilizer value necessary to give the peak ionic cond. in the oxide matrix. The principle is similar for the cubic-oxide thermal-barrier coatings based on HfO2 or TiO2, when stabilized with .gtoreq.30% of La2O3, Yb2O3, or Y2O3. The ZrO2 ceramic coating stabilized with 50% Y2O3 shows linear shrinkage of <4000 ppm after 24 h at 1400.degree., vs. 4 times higher for conventional ZrO2 stabilized with 8% of Y2O3. The cubic HfO2 is optionally stabilized with 30-50% by wt. of Gd2O3.

ST turbine alloy thermal barrier oxide coating vacancy defect; zirconia stabilized ceramic sintering prevention thermal barrier turbine coating

IT Oxides (inorganic), uses

Cite of interest

(2) 25 % needed to give peak ionic

Condition in oxide matrix